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FORMULATION AND EVALUATION OF NON BATHING-SOAP

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ABSTRACT

The non-bathing soap was successfully prepared using castor oil, water, and sodium hydroxide through the saponification process. The formulation proved to be simple, economical, and suitable for cleaning purposes. However, due to the presence of sodium hydroxide, it is not suitable for direct use on skin. This experiment helps in understanding the basic chemistry of soap formation and highlights the practical application of oils in making cleaning products. This experiment helps in understanding the basic chemistry of soap formation and highlights the practical application of oils in making cleaning products.

II. INTRODUCTION

Cleanliness is next to godliness. This given proverb tell us about the importance of cleanliness in a personal life which is achieved by using cleansing chemical and water. Which cleans the body by removing dirt, bacteria and impurities present on the skin surface.

2.1 Human skin(14)

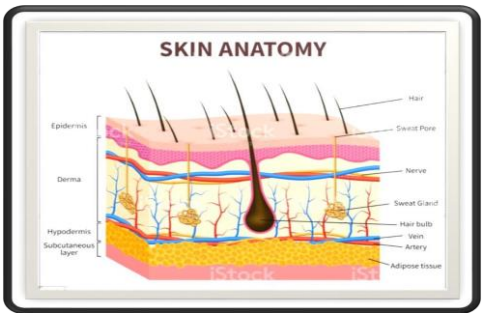


Fig. 1: Skin structure.

Skin is the largest organ of human body. Skin contain 3 layer which is epidermis, dermis, hypodermis. Skin structure help to protect against viruses, UV rays, chemicals. Skin control the temperature of body. Epidermis is the thinnest layer which protect the skin from outside environment. Epidermis contain 5 layer.

1. **Stratum Basal:-** Deepest layer of the epidermis. Also known as Basal Lamina. It contain keratinocytes, which produce protein keratin. Also contain melanocytes which are responsible for producing melanin.
2. **Stratum Spinosum:-** This layer is present between stratum basal and stratum granulosum layer. This layer mostly consist of keratinocytes held together by sticky protein called Desmosomes, which keep the skin flexible and strong. This later contain dendritic cells.
3. **Stratum Granulosum:-** They contain 3-5 cell layer in diamond shape which contain keratohyalin granules and lamellar granules. The keratohyalin aggregate crosslink, bundles keratein precursors. Lamellar granules also contain glycolipid. Which is secreted on the cells surface that keeping cells attached together.
4. **Stratum Lucidum:-** Made with 2-3 layer of cell. Stratum Lucidum present in thick form at palm and soles and this known as anucleated squamosa cell. They contain 20-30 layer of cells.
5. **Stratum Corneum:-** The topmost layer composed of keratin and horny scales were they are made by dead keratinocytes which is known a nucleated squamosa cell that contain 20-30 cell.

Dermis

The dermis is second layer of the skin located right below the epidermis. The dermis is approximately 0.5 to5 millimeters thick, depending on the human body site. For instance, the major layer, which include the papillary and reticular dermis.

Hypodermis

Also known as fascia and it is more deeper than dermis and contain adipose lobules with hair follicle sensory neurons and blood vessels.

1. Soap

Soaps are sodium or potassium salts of long- chain fatty acids.

They are manufactured by the saponification of oil and fat.

Saponification is the process were sodium hydroxide react with oil or fats and break down into salts of respective fatty acid.

Soap is validly used for cleanliness and improve appearance.

Mechanism of action (1)

Its molecules have both hydrophilic **(water-attracting) and** hydrophobic and hydrophobic (water-repelling) parts. When you wash with soap, the hydrophobic part attaches to oil and grease, while the hydrophilic part faces outward, allowing water to surround the grease-covered soap molecules. This forms tiny droplets called micelles, which disperse the grease making it easy rinse away with water.

3. Difference Between Bathing Soap and Non-Bathing Soap.

Feature	**Bathing Soap**	**Non-Bathing Soap**
Purpose	Used for cleaning the Skin	Used for Cleaning Clothes
Skin Safety	Mild and Safe for Skin	Harsh, not Safe for Skin
pH Value	Neutral (7-10)	More Alkaline (10-12)
Ingredients	Moisturizing agents (glycerin, oils, perfumes)	Strong alkali, Less no moisturizers
Effect of Skin	Keep Skin Soft,Smooth	Dryness, Irritation
Quality of Fats/Oils	High-quality oils (coconut, olive oil)	Uses Low-Cost oils ,fats
Example	Tiolet soap, Beauty soap	Laundry soap, Washing soap

III. AIM AND OBJECTIVE

The aim to formulate and evaluate washing powder, Non-bathing soap and Liquid detergent that provides a rich lather and good water solubility, residue formation, shelf stability, and compatibility with different surfaces and fabrics.

Plan to work

a) Formulation

b) Evaluation.

- Physical properties.
- Determination of pH.
- Lathering Volume test.
- Washability.

IVLiterature Review

Non-bathing soaps are widely used in households due to their strong cleaning ability and

cost-effectiveness. They may also contain additives like builders, fillers, or fragrances to enhance performance and appearance. In recent years, there has been a shift towards making non-bathing soaps using eco-friendly ingredients such as vegetable oils and essential oils to reduce environmental impact. These natural alternatives improve biodegradability and reduce harmful effects on water systems while still providing effective cleaning properties.

Non-bathing soap refers to soaps that are specifically designed for cleaning purposes other than personal body use, such as washing clothes, utensils, and household surfaces. These soaps are usually made using oils like coconut oil, castor oil, or other vegetable oils combined with alkali such as sodium hydroxide through the process of saponification. Compared to bathing soaps, non-bathing soaps have a higher alkaline content, which makes them more effective at removing dirt, grease, and stains. However, this high alkalinity also makes them harsh on the skin, so they are not suitable for direct personal use.

VI. Material Profile

A. Liquid Detergent

5.1 Sodium Lauryl Sulfate

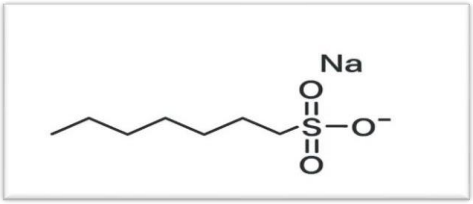


Fig. 3: Structure of Sodium Lauryl.

Form	Solid
Color	White
Odor	Characteristic
Solubility	Soluble in Water

5.1.1 Properties of Sodium Lauryl Sulfate

5.1.2 Composition of Sodium Lauryl Sulfate

Sodium Lauryl Sulfate (SLS) is composed of a long-chain hydrocarbon group known as the lauryl (dodecyl) chain, a sulfate group, and a sodium ion, with the chemical formula $C_{12}H_{25}SO_4Na$. The lauryl chain ($C_{12}H_{25}–$) forms the hydrophobic (oil-attracting) part of the molecule, while the sulfate group ($–SO_4$) acts as the hydrophilic (water-attracting) part, and the sodium ion (Na^+) maintains electrical neutrality. This combination of a hydrophobic tail and a hydrophilic head gives SLS its surfactant properties, allowing it to dissolve in water and effectively remove dirt, oil, and grease.

5.1.3 Uses of Sodium Lauryl Sulfate

Sodium Lauryl Sulfate (SLS) is widely used due to its strong cleansing and foaming properties. It is commonly found in soaps, shampoos, face washes, and body washes where it helps remove dirt, oil, and impurities from the skin and hair while producing a rich lather. In toothpaste, SLS aids in spreading the paste and creating foam for effective cleaning. It is also an important ingredient in liquid and powder detergents, where it helps remove grease and stains from clothes.

Additionally, SLS is used in industrial cleaning products such as floorcleaners and car wash liquids, and in pharmaceutical formulations as a wetting agent to enhance the solubility and effectiveness of certain drugs.

5.2 Sodium Hydroxide

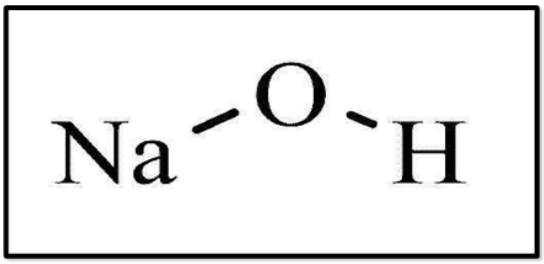


Fig4: Structure of Sodium Hydroxide.

Form	Solid
Color	White
Odor	Odurless
Solubility	HighSolubleWater

VII. MATERIALS AND METHODS

Material Used	Sources
Sodium Lauryl Sulphate	Loba chemicals
Castor Oil	Loba chemicals
Sodium Hydroxide	Loba chemicals
Water	Loba chemicals

Formulation and Evaluation of Non-Bathing Soap Preparation Formulation of Non-Bathing Soap

Sr.no.	Ingredients	Quantity(50gm)
1	Castor Oil	30ml
2	Sodium Hydroxide	5.75gm
3	Water	13.8ml
4	SLS	1gm

Procedure

1. Weigh all ingredients accurately take given amount of water and dissolve NaoH in it.
2. Add castor oil in it.
3. With continues stirring.
4. Transfer in it proper mold and keep for saponification stirring.

VIII. Evaluation Parameter

Evaluation of Non Bathing Detergent

Physical properties

a) Colour

The colour of the Whipped cream soap was checked visually.

b) Odour

Odor is done by smelling it.

8.1.2. Determination of pH Sample

- For testing the pH, the pH meter was calibrated with buffer solution (pH=7 and pH4)
- 1.5g of sample was taken in 15ml distilled water without producing much lather. Keep it still for 24hrs. Measure the pH by calibrated pH meter.

8.1.3. Determination of foam lather

Prepare the 1% solution of sodium lauryl sulphate. Pour 100ml of this solution in blender jar and blend it on low speed for exactly for 60 sec. Immediately pour this solution into 250ml capacity measuring cylinder. Measure the lather volume after levelling off the top surface of foam. The volume obtained with 1% solution of SLS should be 160±100ml. This is the standard or control. (for Sample).

Take 25ml of 75 ppm hard water in the blender jar and add 5 g of grated soap sample. Blend it on low speed for exactly 60 sec. Pour the lather quickly into cylinder and measure the lather volume after levelling off the top surface of foam.

8.1.4. Washability

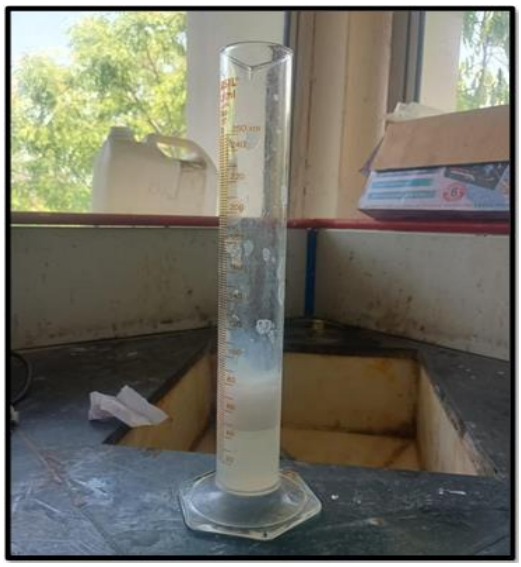
Formulation was applied on the skin easily remove by washing with water were checked manually.

IX. RESULT

9.1 Ph of Non-Bathing Soap

Sr. No.	pH	Result
1	Non- Bathing Soap	10.53

9.2 Determination of Foaming Height



Sr. No.	Foam Height
1	80 m^3

X. CONCLUSION

The non-bathing soap was successfully prepared using castor oil, water, and sodium hydroxide through the saponification process. The formulation proved to be simple, economical, and suitable for cleaning purposes. However, due to the presence of sodium hydroxide, it is not suitable for direct use on skin. This experiment helps in understanding the basic chemistry of soap formation and highlights the practical application of oils in making cleaning products.

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